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PATENT
Docket No. H 3680A PCT/US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Application of
Roberto Pavez Aranguiz
Confirmation No. 4177

Serial No. 10/685,613
Filed: October 15, 2003
Examiner: W. K. Cheung
Art Unit: 1713
Title: FILLER-CONTAINING POLYMER DISPERSION, METHOD FOR ITS PRODUCTION AND ITS USE

CERTIFICATE OF MAILING

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APPEAL BRIEF TRANSMITTAL

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Sir:

Appellant's brief, in triplicate, is transmitted herewith in accordance with 37 C.F.R. § 1.192. Please charge the required fee of $500.00 to our Deposit Account No. 01-1250. Order No. 05-0412.

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Respectfully submitted,

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PATENT & TRADEMARK OFFICE

PATENT
Docket No. H 3680A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re: Application of
Roberto Pavaz Aranguiz — Confirmation No. 5097

Serial No. 10/685,613 — Examiner: W. K. Cheung
Filed: October 15, 2003 — Art Unit: 1713
Title: FILLER-CONTAINING POLYMER DISPERSION METHOD FOR ITS PRODUCTION AND USE

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UNDER 37 C.F.R. § 1.193(b)

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Appellants herewith Appeal from the Examiner's Final Rejection, dated August 13, 2004, of claims 18-39, all of the claims in the Application.

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REAL PARTY IN INTEREST

The entire right and interest to the Application is assigned to Henkel Kommanditgesellschaft auf Aktien, Henkelstrasse 67, 40589 Duesseldorf, Germany.

RELATED APPEALS AND INTERFERENCES

Appellants are not aware of any appeals, interferences or judicial proceedings which would directly affect or be directly affected by or have a bearing on the Board 's decision in the present appeal.

STATUS OF CLAIMS

Claims 1-17 have been cancelled. Claims 18-39 stand rejected under 35 U.S.C. 102(b) as anticipated by, or, in the alternative, under 35 U.S.C. 103(a) as obvious over Martin (U.S. 4,608,401).

STATUS OF AMENDMENTS

All amendments submitted have been entered.

SUMMARY OF CLAIMED SUBJECT MATTER

The invention is a filler-containing polymer dispersion which contains organic or inorganic filler particles and particles of at least one synthetic organic polymer. The ratio of the particle size of the filler particles to the particle size of the polymer particles is in a range of 1.1:1 to 20:1 (page 1, lines 1-5; page 4, line 24 to page 5, line 19 and claim 18). The dispersion contains water (page 4, lines 1,2).

The dispersion of the invention provides surface coatings, adhesives and adhesive bonds at least comparable with filler-free coatings but superior to the filler-containing systems known from the prior art. The filler-containing polymer dispersions of the invention generally have a lower viscosity and better flow behavior than systems known from the prior art with comparable polymer content and filler content (page 4, lines 8-16).

The filler-containing polymer dispersion according to the invention contains at least one water-soluble organic polymer with a molecular weight of more than 600 and an HLB value of at least 15 (page 10, line 30 to Page 11, line 4; claim 18).

The filler-containing polymer dispersion contains filler particles and polymer particles (claim 18; page 1, lines 1-5).

The dispersion of the invention contains polymer particles produced by polymerization of olefinically unsaturated monomers (page 1, lines 14-17). The dispersion containing filler particles and synthetic organic polymer particles is formed by polymerizing the olefinically unsaturated monomers in an aqueous medium in the presence of the filler particles (page 3, lines 25-30; page 4, lines 24-30; claim 18; claim 25; claim 29; page 67, lines 10-14).

The filler particles can be inorganic filler particles, organic filler particles or a mixture of one or more types of inorganic filler particles with one or more types of organic filler particles (page 7, line 2 to page 8, line 15). The filler particles may have smooth, rough or porous surfaces (page 8, lines 16-18).

The particle size of the filler particles in the dispersion is larger than the particle size of the polymer particles. The ratio of the particle diameter of the filler particles to the particle diameter of the polymer particle ranges from1.1:1 to 20:1 (page 3, lines 25-30; claim 18). As used herein the particle size or particle diameter means the "d50" value, i.e., the value at which about 50% of the particles have a smaller diameter and abut 50% of the particles have a larger diameter (page 5, lines 20-23). Since the "d50" value of the particle size of the filler particle is larger than the d50 value of the particle size of the polymer particles, the dispersion cannot comprise filler particles coated with the synthetic organic polymer. Filler particles coated with the synthetic-organic polymer would comprise synthetic organic polymer particles with a larger particle size than the filler particles.

The novel dispersion of the invention is formed by a process in which the synthetic organic polymer particles are polymerized in the presence of the filler particles (page 4, lines 1-7; page 6, line 10-14; claim 18; claim 25).

The dispersion is preferably prepared by emulsion polymerization (page 17, lines 24-29; page 18, lines 25, 26).

The process comprises dispersing the filler particles in water with the use of surfactants or dispersants, preferable at least ionic surfactants with an HLB value of 1-10 (page 18, lines 25-30; page 12, lines 5-7). The dispersion of the filler particles also contains a water soluble polymer with a molecular weight of at least 600 and an HLB value of more than 15 (page 19, lines 4-15). A polymerization initiator is then dissolved in the filler particle dispersion (page 19, lines 24-30) and the monomer added to the mixture to form the synthetic organic polymer particles in the presence of the filler particles.

Other similar processes may be utilized but the synthetic organic polymer particles are always formed by polymerization in the presence of the filler particles dispersed in an aqueous phase. The polymerization of the monomers to form the synthetic organic polymer particles is generally done at an elevated temperature (page 21, lines 29, 30). The dispersion of the invention can also be prepared using cationic, anionic, ampholytic and nonionic surfactants and mixtures thereof (page 12, lines 9, 10 and page 14, lines 10-13; the examples page 22-25).

The polymerization to form the synthetic organic polymer particles uses a water soluble initiator such as tert-butyl hydroperoxide, sodium peroxydisulfate, peroxo disulfuric acid, cumene hydroperoxide, hydrogen peroxide, sodium or potassium percarbonate (page 20, lines 23-27). The preferred initiators are sodium persulfate, potassium persulfate and ammonium presulfate (page 21, lines 2-4; examples, page 22, line 30).

The dispersion of the invention has properties unexpectently superior to dispersions formed by adding filler particles to a polymer dispersion (page 3, lines 18-24).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Does Martin anticipate the present invention?
2. Does Martin provide a prima facie case of obviousness which supports a rejection under 35 U.S. C. 103(a)?
3. Does Martin teach away from the present invention?

ARGUMENT

Claims 18-39 stand rejected under 35 U.S.C. 102(b), or in the alternative, under 35 U.S. C. 103(a) over Martin (U.S. 4,608,401). Appellants submit that Martin neither teaches nor suggests the present invention. Appellants contend that Martin teaches away from the present invention.

Martin is directed to water insoluble solid particles free from ionic charges ranging in size from 0.01 to several hundred microns or higher, including but not limited to paint pigment particles, which are given a generally uniform encapsulation by admixing such particles in an aqueous reaction medium with a water insoluble monomer polymerizable to form a generally water insoluble polymer free of ionic charges in the presence of a nonionic surface active stabilizing agent...with heating with a redox polymerization initiator system which is free of ionic groups and does not decompose to release ionic groups in the reaction medium...The polymerization product is a suspension of generally discrete particles enveloped within a polymeric coating...(See Martin Abstract).

The Martin dispersion does not contain any separate particles of filler and synthetic organic polymer (Col. 18, lines 1, 2; Col. 19, lines 55-62; Col. 23, lines 1-3; Col. 24, lines 5-7; Col. 26, lines 26-35). The dispersion of the filler particles enveloped in a uniform polymer coating of Martin is obtained by polymerization of the monomer in the presence of the filler particles in the absence of ionic components in the reaction mixture. The filler particles cannot be treated with ionic species, the surfactant or suspending agent cannot be ionic and anything added to the reaction mixture such as the initiator cannot be ionic or break down into ionic species during the process (Col 7, line 62 – Col. 8,line 13; Col. 9, lines 16-19; Col. 11, lines 23-25, lines 37-45; Col. 13, lines 62- Col. 14,line 3; Col. 16, lines 54-62).

The process of Martin requires no pre-dispersion or pre-treatment of the filler particles (Col. 17,lines 59, 60).

Polymerization initiators such as persulfates (a preferred initiator of the process of the present invention, see examples, pages 22-24) cannot be used as the initiator in the Martin process.

The Martin process does not require that the filler particles be broken down into primary particles as in the present process since the filler particles are broken down into primary particles by the nature of the process (Col. 16, lines 26-45) in which the agglomerates of the filler particles are broken down to primary particles by the polymerization reaction.

In the final rejection, the Examiner states:

> "Applicants argue that the claimed invention involves a polymer dispersion containing separate filler particles and polymer particles, not as encapsulated particles. However, such argued features are not in the claims".

Appellants have drafted the claims within the bounds of the capabilities of the English language to claim a dispersion containing filler particles and polymer particles. In addition, the filler particles have a particle size larger than the particle size of the polymer particles (ratio 1.1:1 to 20:1). Clearly this limitation teaches that the filler particles of the present invention cannot be encapsulated in the polymer particles, as in Martin. In the Martin dispersion, the polymer particles are larger than the filler particles since the polymer surrounds the filer particles.

In the final rejection, the Examiner states:

> "Further, applicants argue that Martin teaches that all ionic materials must be excluded to the extend possible from the polymerizing mixture. However, applicant fails to recognize that Martin (Col. 9, line 62 to Col. 21, line 24) discloses a dispersion comprising stabilizing agents (such as polyethoxylated nonyl phenol, polyethylene oxide and Renex 300), and polyethoxylated nonyl phenol is an ionic stabilizer (emulsifier) which is an ionic material."

Appellants respectfully submit that the Examiner does not understand chemistry and the nature of polyethoxylated nonyl phenol in particular.

Appellants submit that polyethoxylated nonyl phenol is a nonionic material. This is well known and well understood in the art. The Examiner, has not pointed out any ionic group which could possibly be present in polyethoxylated nonyl phenol. This position is consistent with the teachings of Martin that ionic species are excluded from the dispersion during the polymerization due to the deleterious affects on the reaction product (Col. 11, lines 15-36).

The Examiner clearly misunderstands the teachings of Martin and the nonionic nature of polyethoxylated nonyl phenol.

In the Official Action of May 11, 2004, the Examiner states:

> "In view of the substantially identical composition and preparation process disclosed in Martin and the invention of claims 18-39, the examiner has reasonable basis to believe that the claimed ratio of a particle size of the filler particles to a particle size of the polymer particles is in the range from 1.1:1 to 20:1. Since the PTO doe not have proper means to conduct experiments, the burden of proof is now shifted to applicants to show otherwise. In re Best, 562

> F.2d 1252, 195 USPQ 430 (CCPA 1977); in re Fitzgerald, 205 USPQ 594 (CCPA 1980)."

Appellants respectfully submit that the Examiner does not understand the teachings of Martin and does not understand the invention as claimed in claims 18-39 of the subject application.

The Martin dispersion does not contain separate particles of filler and particles of polymer. As set forth above, the Martin dispersion contains particles of filler totally encapsulated in the polymer. There are not separate filler particles and polymer particles in the dispersion formed by the Martin process (see examples 6-11). This makes the Martin dispersion totally different than the dispersion as claimed in the subject application.

Since the filler particles are totally encapsulated in the polymer, there is only one type of particle. If one views the Martin dispersion as comprising filler particles and polymer particles, the polymer particles would in all cases be larger than the filler particles since the polymer encapsulates the filler particles and therefore must be larger. With this view of the Martin dispersion, the ratio of a particle size of filler particles to a particle size of polymer particles must in all cases be less than 1:1.

The examiner has attempted to shift the burden to appellants to disprove that the ratio of the particle size of the filler particles to the particle size of the polymer particles of the Martin dispersion is from 1.1:1 to 20,1. The examiner makes this demand on the basis that the processes are substantially identical and the compositions are substantially identical.

The compositions are not identical, similar or obvious over each other. The Martin composition contains only one type of particle while the composition of the present invention contains filler particles and synthetic organic polymer particles (two different types of particles). (See examples of Martin where no polymer particles are present).

As claimed in claim 22, 24, 26, 29, 37, 38, 39 the polymer dispersion contains and is formed in the presence of an ionic surfactant which cannot be included in the polymerization medium of Martin. Clearly, Martin teaches away from the present invention.

In addition to the use of anionic surfactants, the process of the invention uses initiators which produce ionic species in the reaction mixture. Martin specifically teaches that persulfate initiators cannot be used in the process since they provide ionic species which coagulate the mixture. Persulfate initiators are a preferred species to use as initiators in the present process (see examples). Martin teaches away from the present invention.

As discussed supra, the dispersion of the present invention contains two different particles, filler particles and synthetic organic polymer particles. This is clear from the language of the claims. The Martin dispersion contains only one type of particle, i.e., filler particles encapsulated in, or completely covered with, the synthetic organic polymer. Appellants submit that the dispersions as claimed are different compositions which have different particle components, different properties and one would not teach or suggest the other.

Appellants submit that Martin teaches away from the dispersion and the process of the invention.

One can speculate that the dispersions and the processes are the same but the clear language of the claims points to compositions which are different and are produced by processes which are different.

Appellants submit that at least claims which utilize and contain ionic species are not the same as the dispersion or process of Martin since Martin teaches that ionic species cannot be preset during formation of the dispersions.

In addition Martin teaches away from a composition containing filler particles and synthetic organic polymer particles in the dispersion. All of the dispersions analyzed in the Martin disclosure do not contain any filler particles and synthetic organic polymer particles but contain filler particles encapsulated with the synthetic organic polymer thus only one type of particle is present.

SUMMARY

Martin fails as a reference on which a rejection under 35 .U.S.C. 102(b) can be based since Martin fails to teach or suggest a dispersion containing two types of particles, i.e., filler particles and synthetic organic polymer particles where the ratio of a particle size of the filler particles to a particle size of a synthetic organic polymer particle is from 1.1:1 to 20:1. The filler particles of the Martin dispersion must always be smaller than the polymer particles since the filler particles are encapsulated or totally surrounded by the polymer.

Martin fails as a reference on which a rejection under 35 U.S.C. 103(a) can be based since Martin fails to teach or suggest the dispersion of the subjected invention and teaches away from a dispersion containing two types of particles. The very essence of the Martin invention is a dispersion containing only one type of particle.

Martin fails as a reference since Martin neither teaches nor suggests a process for preparing the dispersion of the subject invention comprising filler particles and synthetic organic polymer particles in which the synthetic organic polymer particles are formed in the presence of the filler particles.

Martin fails as a reference since Martin neither teaches nor suggests, in fact, teaches away from a process which utilizes ionic surfactants or initiators which form ionic species in the process to form a dispersion containing filler particles and synthetic organic polymer particles.

For the above reasons, appellants submit that claims 18-39 are patentable over Martin and request that the rejections over Martin be reversed.

Respectfully submitted,

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CLAIMED APPENDIX

18. A filler-containing polymer dispersion comprising water, particles of at least one filler selected from the group consisting of organic fillers, inorganic fillers and mixtures thereof, at least one water-soluble organic polymer with a molecular weight of more than 600 and an HLB value of at least 15 and particles of at least one synthetic organic polymer, polymerized in the presence of at least one type of the filler particles, wherein a ratio of a particle size of the filler particles to a particle size of a polymer particles is in the range from 1.1:1 to 20:1.

19. The filler-containing polymer dispersion as claimed in claim 18 wherein the polymer particles have a diameter (d50) of 0.03 to 0.5 μm.

20. The filler-containing polymer dispersion as claimed in claim 18, wherein the inorganic filler comprises a member selected from the group consisting of chalk ($CaCO_3$), gypsum ($CaSO_4$) as anhydrite, hemihydrate or dihydrate, silica flour, silica gel, titanium dioxide, talcum, a layer silicate, barium sulfate, barite and mixtures thereof and wherein the organic filler comprises a member selected from the group consisting of polyvinyl acetate, vinyl acetate copolymers, polystyrene, polyethylene, polypropylene, waxes, polybutylene, polybutadiene, copolymers of butadiene and styrene, polyacrylonitrile, resins, polyacrylate esters, polymethacrylate esters polymers containing silyl groups and mixtures thereof.

21. The filler-containing polymer dispersion as claimed in claim 18, wherein the at

least one water-soluble polymer comprises a member selected from the group consisting of polyvinyl alcohol, cellulose ethers, carboxymethyl celluloses, hydroxyethyl celluloses, casein, potassium alginate, sodium alginate, polyurethanes and mixtures thereof.

22. The filler-containing polymer dispersion as claimed in claim 18, wherein the dispersion comprises at least one ionic surfactant with an HLB value of 1 to 10.

23. The filler-containing polymer dispersion as claimed in claim 18 wherein the dispersion comprises at least one nonionic surfactant with an HLB value of 13 to 20.

24. The filler-containing polymer dispersion as claimed in claim 18 comprising:

a) 10% to 70% by weight of a water-insoluble organic polymer;
b) 5% to 55% by weight of filler particles;
c) 0.02% to 1.0% by weight of a nonionic surfactant with an HLB value of 13 to 20;
d) 0.01% to 1.0% by weight of an ionic surfactant with an HLB value of 1 to 10;
e) 0.05% to 10% by weight of the water-soluble organic polymer with a molecular weight of more than 600 and an HLB value of more than 15;
f) 24.92% to 84.89% by weight of water and
g) 0 to 30% by weight of additives.

25. The process for the production of a filler-containing polymer dispersion, which

comprises: emulsion polymerizing at least one radical-polymerizable monomer in an aqueous phase using a polymerization initiator, the aqueous phase containing filler particles of at least one dispersed filler with a particle size (d50) of 0.01 to 0.5μm and at least one water-soluble organic polymer with a molecular weight of more than 600 and an HLB value of more than 15 whereby a dispersion comprising filler particles and polymer particles is formed.

26. The process as claimed in claim 25, wherein the aqueous phase contains an ionic surfactant.

27. The process as claimed in claim 25, wherein the aqueous phase contains a nonionic surfactant.

28. The process as claimed in claim 25, wherein the polymerization initiator is water-soluble.

29. The process as claimed in claim 25, wherein the process is carried out in at least two successive stages comprising:

a) a first stage comprising preparing a dispersion containing:

1) at least one ionic surfactant with an HLB value of 1 to 10 or a nonionic surfactant with an HLB value of 13 to 20 or a mixture of two or more thereof,

2) at least one inorganic filler with a particle size (d50) of 0.01 to 0.5 μm,

3) at least one polymerization initiator and

4) at least one water-soluble organic polymer with a molecular weight of

more than 600 and an HLB value of more than 15 and then heating the dispersion to a temperature of 70 to 90°C; and

b) a second stage comprising adding and polymerizing at least one radical-polymerizable monomer in the dispersion prepared in the first stage.

30. The process as claimed in claim 29 wherein the inorganic filler particles are added before the polymerization initiator.

31. The process as claimed in claim 25, wherein the filler particles dispersed in the aqueous phase are pre-emulsified with one or more monomers.

32. The process as claimed in claim 31, wherein the polymerization initiators are added in portions to the dispersion.

33. The filler-containing polymer dispersion, produced by the process claimed in claim 25.

34. An adhesive or surface coating composition, comprising at least one filler-containing polymer dispersion of claim 18.

35. The adhesive or surface coating composition produced by the process of claim 25.

36. The filler-containing polymer of claim 19, wherein the inorganic filler comprises a member selected from the group consisting of chalk ($CaCO_3$), gypsum ($CaSO_4$) as anhydrite, hemihydrate or dihydrate, silica flour, silica gel, titanium dioxide, talcum, a layer silicate, barium sulfate, barite and mixtures thereof and wherein the organic filler comprises a member selected from the group consisting of

polyvinyl acetate vinyl acetate copolymers, polystyrene, polyethylene, polypropylene, waxes, polybutylene, polybutadiene, copolymers of butadiene and styrene, polyacrylonitrile, resins, polyacrylate esters, polymethacrylate esters polymers containing silyl groups and mixtures thereof.

37. The filler-containing polymer dispersion as claimed in claim 19, wherein the dispersion comprises at least one ionic surfactant with an HLB value of 1 to 10.

38. The filler-containing polymer dispersion as claimed in claim 18 comprising:

a) 10% to 70% by weight of a water insoluble organic polymer;

b) 5% to 55% by weight of filler particles;

c) 0.05% to 0.5% by weight of a nonionic surfactant with an HLB value of 13 to 20;

d) 0.02% to 0.5% by weight of an ionic surfactant with an HLB value of 1 to 10;

e) 0.05% to 10% by weight of a water-soluble organic polymer with a molecular weight of more than 600 and an HBL value of ore than 15;

f) 24.88% to 84.88% by weight of water; and

g) 0% to 30% by weight of additives.

39. The filler-containing polymer dispersion of Claim 18 containing at least one nonionic surfactant with an HLB of 13 to 20 and an ionic surfactant with an HLB of 1 to 10 wherein a ratio by weight of nonionic surfactant to ionic surfactant is from about 5:1 to about 1:5.